

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Original) A liquid-crystalline medium having a helically twisted structure comprising a nematic component and an optically active component, wherein:

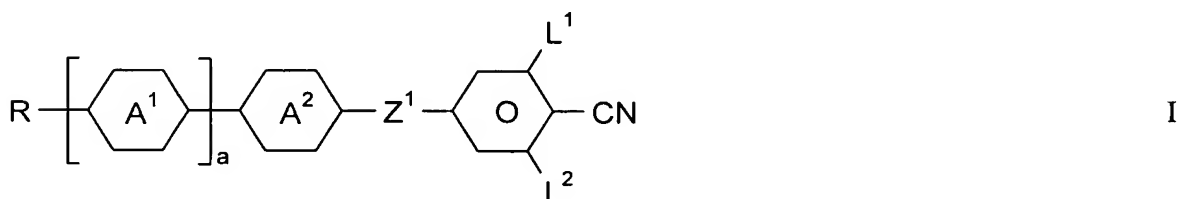
the optically active component comprises one or more chiral compounds whose helical twisting power and concentration are selected in such a way that the helix pitch of the medium is $\leq 1 \mu\text{m}$, and

the medium has a birefringence Δn of ≤ 0.16 .

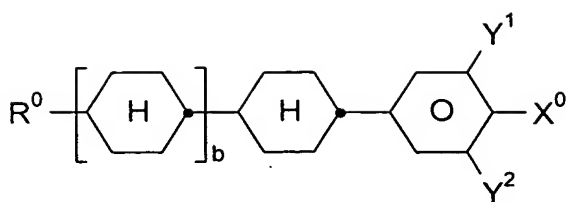
2. (Original) A liquid-crystalline medium having a helically twisted structure comprising a nematic component and an optically active component, wherein:

the optically active component comprises one or more chiral compounds whose helical twisting power and concentration are selected in such a way that the helix pitch of the medium is $\leq 1 \mu\text{m}$, and

the nematic component comprises one or more compounds of the formula I



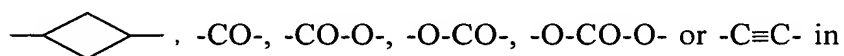
and one or more compounds of the formula II



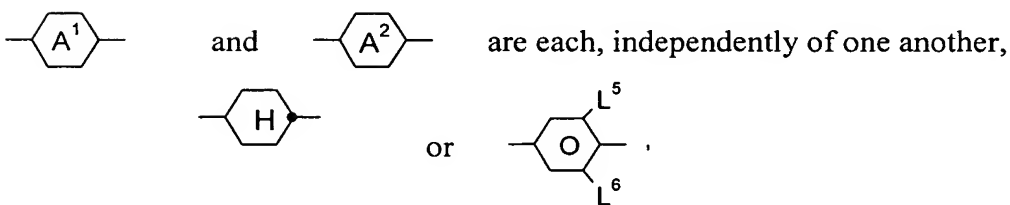
II

in which

R and R^0 are each, independently of one another, H or an alkyl or alkenyl radical having from 1 to 15 carbon atoms which is unsubstituted, monosubstituted by CN or CF_3 or at least monosubstituted by halogen, where one or more CH_2 groups in these radicals are optionally, independently of one another, replaced by $-\text{O}-$, $-\text{S}-$,



such a way that O atoms are not linked directly to one another,



L^1 , L^2 , L^5 and L^6 are each, independently of one another, H or F,

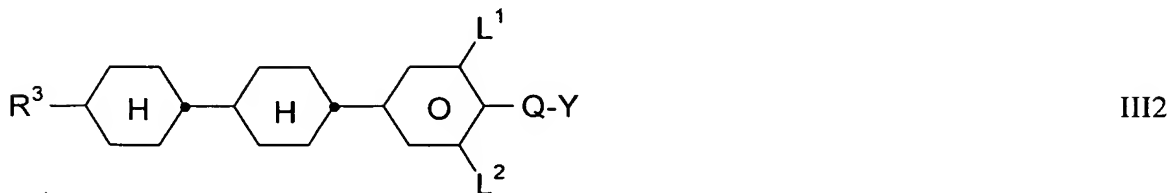
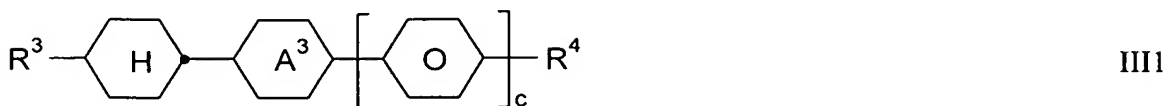
Z^1 is $-\text{COO}-$ or, if at least one of the radicals A^1 and A^2 is trans-1,4-cyclohexylene, is alternatively $-\text{CH}_2\text{CH}_2-$ or a single bond,

Y^1 and Y^2 are each, independently of one another, H or F,

X^0 is F, Cl, CN, halogenated alkyl, alkenyl or alkoxy having from 1 to 6 carbon atoms, and

a and b are each, independently of one another, 0 or 1.

3. (Currently Amended) A medium according to Claim 2, ~~with~~ which additionally comprises one or more alkenyl compounds selected from the following formulae:



in which

A^3 is 1,4-phenylene or trans-1,4-cyclohexylene,

c is 0 or 1,

R^3 is an alkenyl group having from 2 to 7 carbon atoms,

R^4 is an alkyl, alkoxy or alkenyl group having from 1 to 12 carbon atoms, in which one or two non-adjacent CH_2 groups are optionally replaced by -O-, -CH=CH-, -C≡C-, -CO-, -OCO- or -COO- in such a way that O atoms are not linked directly to one another,

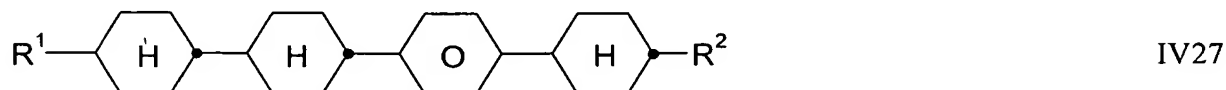
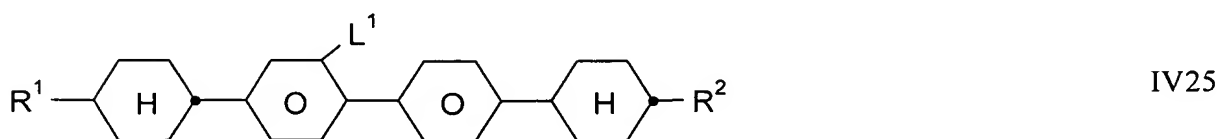
Q is CF_2 , OCF_2 , CFH , OCFH or a single bond,

Y is F or Cl, and

L^1 and L^2 are each, independently of one another, H or F,

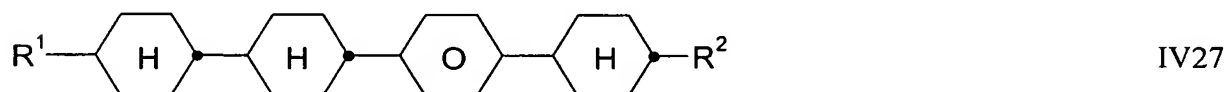
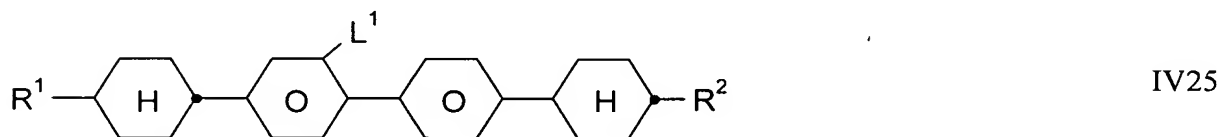
provided that when the compound is of formula III2, it is different from the compound of formula II in the medium.

4. **(Original)** A medium according to Claim 2, which additionally comprises one or more compounds selected from the following formulae:



in which R^1 and R^2 have one of the meanings indicated for R in the formula I, and L is H or F.

5. **(Original)** A medium according to Claim 3, which additionally comprises one or more compounds selected from the following formulae:



in which R^1 and R^2 have one of the meanings indicated for R in the formula I, and L is H or F.

6. **(Original)** A medium according to Claim 2, wherein the proportion of compounds of the formula I in the mixture as a whole is from 7 to 80% by weight.

7. **(Original)** A medium according to Claim 2, wherein the proportion of compounds of the formula II in the mixture as a whole is from 5 to 50% by weight.

8. **(Original)** A medium according to Claim 2, wherein the proportion of the optically active component is from 0.01 to 7%.

9. **(Original)** A medium according to Claim 2, wherein the medium has a reflection wavelength in the range from 400 to 800 nm.

10. **(Currently Amended)** A medium according to Claim 2, wherein the medium has a birefringence ~~Δn of < 0.16~~ Δn of ≤ 0.16 .

11. **(Original)** An electro-optical liquid-crystal display containing a liquid-crystalline medium according Claim 1.

12. **(Original)** An electro-optical liquid-crystal display containing a liquid-crystalline medium according Claim 2.

13. **(Original)** An electro-optical liquid-crystal display according to Claim 11, which display is a cholesteric, SSCT, PSCT or flexoelectric display.

14. (Original) An electro-optical liquid-crystal display according to Claim 12, which display is a cholesteric, SSCT, PSCT or flexoelectric display.

15. (New) An electro-optical liquid-crystal display according to Claim 11, wherein the display has a layer thickness of the liquid crystal cell, d , and the medium has a helix pitch, p , such that the ratio d/p is from 2 to 20.

16. (New) An electro-optical liquid-crystal display according to Claim 12, wherein the display has a layer thickness of the liquid crystal cell, d , and the medium has a helix pitch, p , such that the ratio d/p is from 2 to 20.

17. (New) A medium according to claim 1, wherein the helix pitch of the medium is from 200 nm to 750 nm.

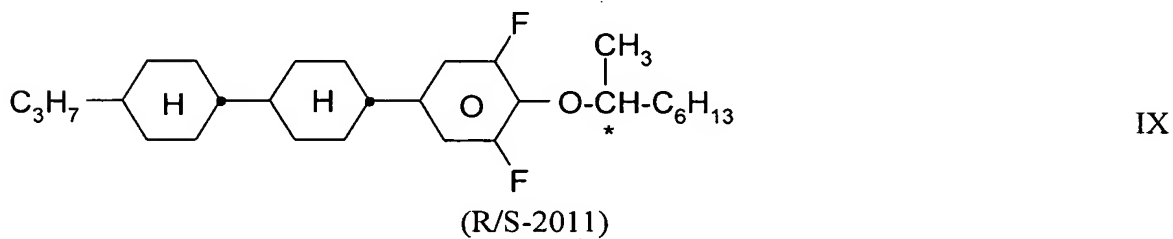
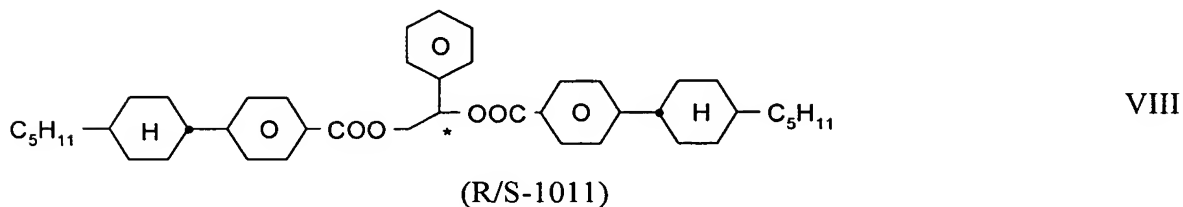
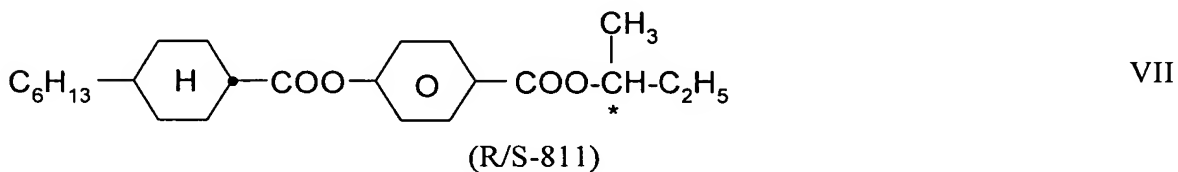
18. (New) A medium according to claim 2, wherein the helix pitch of the medium is from 200 nm to 750 nm.

19. (New) A medium according to claim 1, wherein the optically active component exhibits a helical twisting power of $20 \mu\text{m}^{-1}$ or more.

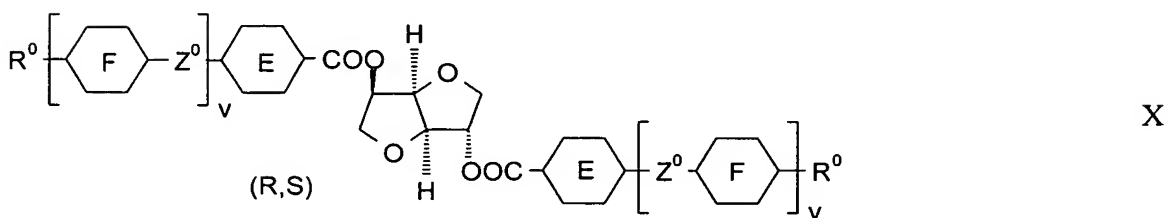
20. (New) A medium according to claim 2, wherein the optically active component exhibits a helical twisting power of $20 \mu\text{m}^{-1}$ or more.

21. (New) A medium according to claim 1, wherein the optically active component includes at least one compound of the following:

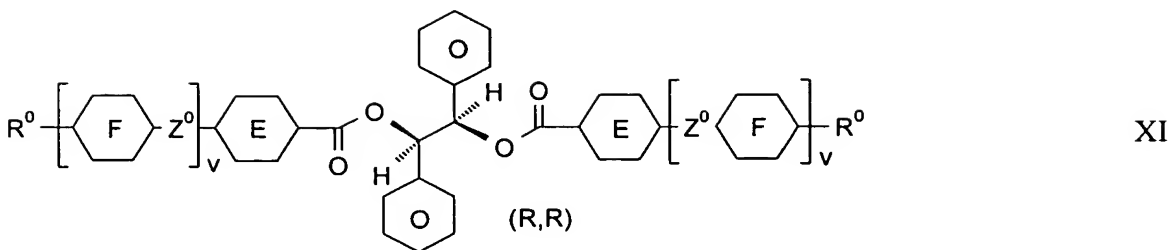
- cholesteryl nonanoate,
- compounds of the formulae VII to IX:



- compounds of the formula X:



- compounds of the formula XI:



wherein, in formula X and XI,

E and F are each, independently of one another; 1,4-phenylene, which is optionally monosubstituted, disubstituted or trisubstituted by L; or 1,4-cyclohexylene,

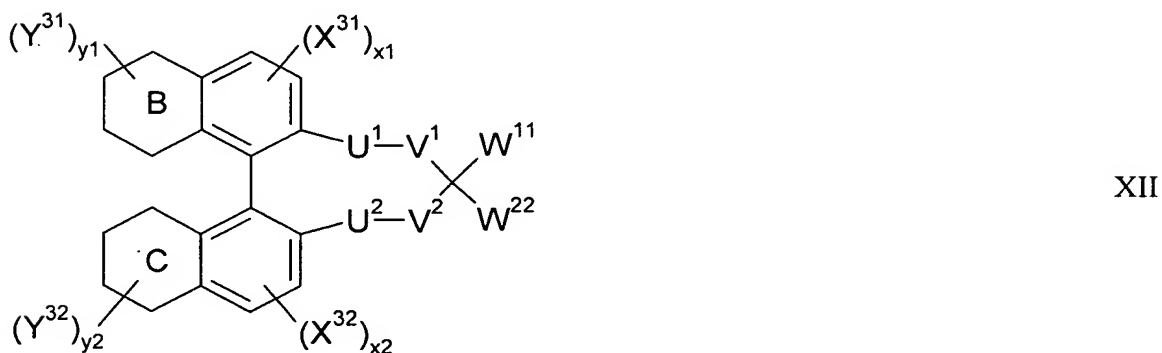
L is H, F, Cl, CN or optionally halogenated alkyl, alkoxy, alkylcarbonyl, alkoxycarbonyl or alkoxycarbonyloxy having 1-7 carbon atoms,

v is 0 or 1,

Z⁰ is -COO-, -OCO-, -CH₂CH₂- or a single bond, and

R is alkyl, alkoxy, alkylcarbonyl, alkoxycarbonyl or alkylcarbonyloxy having 1-12 carbon atoms,

compounds of the formula XII:



in which:

X³¹, X³², Y³¹ and Y³² are each, independently of one another: H; F; Cl; Br; I; CN; SCN; SF₅; straight-chain or branched alkyl having up to 25 carbon atoms, unsubstituted

or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which one or more non-adjacent CH₂ group, independently of one another, are optionally replaced by -O-, -S-, -NH-, -NR⁰⁰-, -CO-, -COO-, -OCO-, -OCO-O-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a way that O and/or S atoms are not linked directly to one another; a polymerizable group; cycloalkyl or aryl having up to 20 carbon atoms, which are optionally monosubstituted or polysubstituted by L or a polymerizable group,

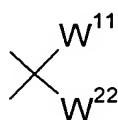
R⁰⁰ is H or alkyl having from 1 to 4 carbon atoms,

x¹ and x² are each, independently of one another, 0, 1 or 2,

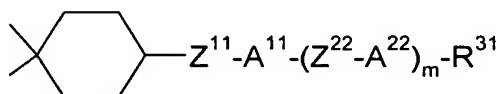
y¹ and y² are each, independently of one another, 0, 1, 2, 3 or 4,

B and C are each, independently of one another, an aromatic or partially or fully saturated aliphatic six-membered ring, in which one or more CH groups are optionally replaced by N and one or more CH₂ groups are optionally replaced by O and/or S,

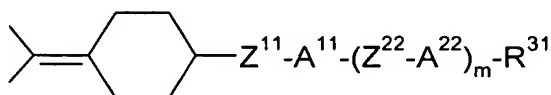
one of the radicals W¹¹ and W²² is -Z¹¹-A¹¹-(Z²²-A²²)_m-R³¹ and the other is R³² or A³³, or both radicals W¹¹ and W²² are -Z¹¹-A¹¹-(Z²²-A²²)_m-R³¹, where W¹ and W² are not simultaneously H, or



is

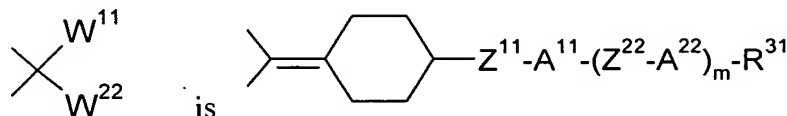


or



U¹ and U² are each, independently of one another, CH₂, O, S, CO or CS,

V^1 and V^2 are each, independently of one another, $(CH_2)_n$, in which up to four non-adjacent CH_2 groups are optionally replaced by O and/or S, and one of the radicals V^1 and V^2 or, if



one or both radicals V^1 and V^2 are alternatively a single bond,

n is an integer from 1 to 7,

Z^{11} and Z^{22} are each, independently of one another, -O-, -S-, -CO-, -COO-, -OCO-, -O-COO-, -CO-NR⁰⁰-, -NR⁰⁰-CO-, -OCH₂-, -CH₂O-, -SCH₂-, -CH₂S-, -CF₂O-, -OCF₂-, -CF₂S-, -SCF₂-, -CH₂CH₂-, -CF₂CH₂-, -CH₂CF₂-, -CF₂CF₂-, -CH=CH-, -CH=N-, -N=CH-, -N=N-, -CF=CH-, -CH=CF-, -CF=CF-, -C≡C-, -CH=CH-COO-, -OCO-CH=CH- or a single bond,

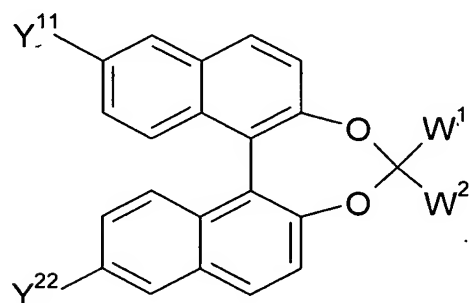
A^{11} , A^{22} and A^{33} are each, independently of one another: 1,4-phenylene, in which, in addition, one or more CH groups are optionally replaced by N; 1,4-cyclohexylene, in which, one or more non-adjacent CH_2 groups are optionally replaced by O and/or S; 1,3-dioxolane-4,5-diyl; 1,4-cyclohexenylenyl; 1,4-bicyclo[2.2.2]octylene; piperidine-1,4-diyl; naphthalene-2,6-diyl; decahydronaphthalene-2,6-diyl; or 1,2,3,4-tetrahydronaphthalene-2,6-diyl; where all these groups are unsubstituted or monosubstituted or polysubstituted by L, and A^{11} is alternatively a single bond,

L is halogen, CN, NO₂ or an alkyl, alkoxy, alkylcarbonyl or alkoxycarbonyl group having from 1 to 7 carbon atoms, in which one or more H atoms are optionally replaced by F or Cl,

m is in each case, independently of one another, 0, 1, 2 or 3, and

R^{31} and R^{32} are each, independently of one another: H; F; Cl; Br; I; CN; SCN; OH; SF_5 ; straight-chain or branched alkyl having up to 25 carbon atoms, which is unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which, one or more non-adjacent CH_2 groups, each independently of one another, are optionally replaced by -O-, -S-, -NH-, $-NR^{00}$ -, -CO-, -COO-, -OCO-, -OCO-O-, -S-CO-, -CO-S-, -CH=CH- or $-C\equiv C-$ in such a way that O and/or S atoms are not linked directly to one another; or a polymerizable group,

- compounds of the formula XIII:

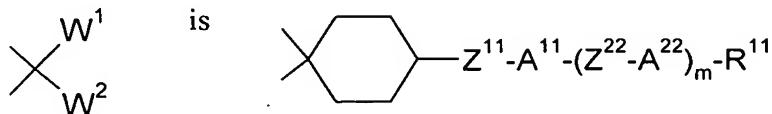


XIII

in which:

Y^{11} and Y^{22} are each, independently of one another: H; F; Cl; Br; I; CN; SCN; SF_5 ; a chiral or achiral alkyl having up to 30 carbon atoms, which is optionally unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which one or more non-adjacent CH_2 groups are each, independently of one another, optionally replaced by -O-, -S-, -NH-, $-N(CH_3)$ -, -CO-, -COO-, -OCO-, -OCO-O-, -S-CO-, -CO-S-, -CH=CH- or $-C\equiv C-$ in such a way that O atoms are not linked directly to one another; or a polymerizable group,

one of the radicals W^1 and W^2 is $-Z^{11}-A^{11}-(Z^{22}-A^{22})_m-R^{11}$ and the other is H, R^{22} or A^{33} , or both radicals W^1 and W^2 are $-Z^1-A^1-(Z^2-A^2)_m-R$, where W^1 and W^2 are not simultaneously H, or



Z^{11} and Z^{22} are each, independently of one another, -O-, -S-, -CO-, -COO-, -OCO-, -O-COO-, -CO-N(R^{00})-, -N(R^{00})-CO-, -OCH₂-, -CH₂O-, -SCH₂-, -CH₂S-, -CF₂O-, -OCF₂-, -CF₂S-, -SCF₂-, -CH₂CH₂-, -CF₂CH₂-, -CH₂CF₂-, -CF₂CF₂-, -CH=CH-, -CH=N-, -N=CH-, -N=N-, -CF=CH-, -CH=CF-, -CF=CF-, -C≡C-, -CH=CH-COO-, -OCO-CH=CH- or a single bond,

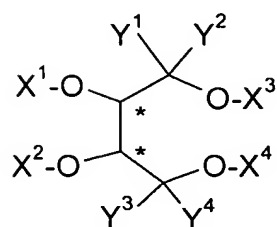
R^{00} is H or alkyl having from 1 to 4 carbon atoms,

A^{11} , A^{22} and A^{33} are each, independently of one another: 1,4-phenylene, in which, one or more CH groups are optionally replaced by N; 1,4-cyclohexylene, in which one or more non-adjacent CH₂ groups are optionally replaced by O and/or S; 1,3-dioxolane-4,5-diyl; 1,4-cyclohexenylenyl; 1,4-bicyclo[2.2.2]octylene; piperidine-1,4-diyl; naphthalene-2,6-diyl; decahydronaphthalene-2,6-diyl; or 1,2,3,4-tetrahydronaphthalene-2,6-diyl, where all these groups are unsubstituted or monosubstituted or polysubstituted by halogen, CN or NO₂ or alkyl, alkoxy, alkylcarbonyl or alkoxy carbonyl having from 1 to 7 carbon atoms, in which one or more H atoms are optionally replaced by F or Cl, and A^{11} is alternatively a single bond,

m is 0, 1, 2 or 3, and

R^{11} and R^{22} are each, independently of one another, as defined for Y^{11} ,

- compounds of formula XIV



XIV

in which

X^1 and X^2 are H, or together form a bivalent radical selected from the group consisting of $-\text{CH}_2-$, $-\text{CHR}^{11}-$, $-\text{CR}^{11}_2-$, $-\text{SiR}^{11}_2-$ and 1,1-cycloalkylidene,

X^3 and X^4 have one of the meanings indicated for X^1 and X^2 ,

Y^1 , Y^2 , Y^3 and Y^4 may be identical or different and are each, independently of one another, R^{11} , A or M-R^{22} ,

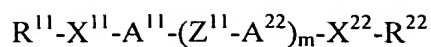
A is a cyclic group,

M is a mesogenic group, and

R^{11} and R^{22} are each, independently of one another: H; F; Cl; Br; CN; SCN; SF_5 ; a chiral or achiral alkyl having up to 30 carbon atoms, which is unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which one or more non-adjacent CH_2 groups are each, independently of one another, optionally replaced by $-\text{O}-$, $-\text{S}-$, $-\text{NH}-$, $-\text{N}(\text{CH}_3)-$, $-\text{CO}-$, $-\text{COO}-$, $-\text{OCO}-$, $-\text{OCO-O}-$, $-\text{S-CO}-$, $-\text{CO-S}-$, $-\text{CH=CH}-$ or $-\text{C}\equiv\text{C}-$ in such a way that O atoms are not linked directly to one another; or are a polymerizable group,

where at least one of the radicals Y^1 , Y^2 , Y^3 and Y^4 is M-R^{22} ,

- compounds of the formula XV



XV

in which

R^{11} and R^{22} are each, independently of one another: H; F; Cl; Br; CN; SCN; SF_5 ; a chiral or achiral alkyl having up to 30 carbon atoms, which is unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which one or more non-adjacent CH_2 groups are each, independently of one another, optionally replaced by -O-, -S-, -NH-, -N(CH₃)-, -CO-, -COO-, -OCO-, -OCO-O-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a way that O atoms are not linked directly to one another; a chiral radical containing one or more aromatic or aliphatic ring groups, which optionally contains fused or spiro-linked rings and one or more heteroatoms; or a polymerizable group,

X^{11} and X^{22} are each, independently of one another, -CF₂O-, -OCF₂-, -CF₂S-, -SCF₂-, -CF₂CH₂-, -CH₂CF₂-, -CF₂CF₂-, -CF=CH-, -CH=CF-, -CF=CF- or a single bond,

Z^{11} is in each case, independently of one another, -O-, -S-, -CO-, -COO-, -OCO-, -O-COO-, -CO-N(R⁰⁰)-, -N(R⁰⁰)-CO-, -OCH₂-, -CH₂O-, -SCH₂-, -CH₂S-, -CF₂O-, -OCF₂-, -CF₂S-, -SCF₂-, -CH₂CH₂-, -CF₂CH₂-, -CH₂CF₂-, -CF₂CF₂-, -CH=CH-, -CF=CH-, -CH=CF-, -CF=CF-, -C≡C-, -CH=CH-COO-, -OCO-CH=CH- or a single bond,

R^{00} is H or alkyl having from 1 to 4 carbon atoms,

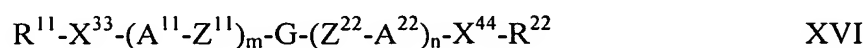
A^{11} and A^{22} are each, independently of one another: 1,4-phenylene, in which, in addition, one or more CH groups are optionally replaced by N; 1,4-cyclohexylene, in which one or two non-adjacent CH_2 groups are optionally replaced by O and/or S; 1,3-dioxolane-4,5-diyl; cyclohexenylenyl; bicyclo[2.2.2]octylene; piperidine-1,4-diyl; naphthalene-2,6-diyl; decahydronaphthalene-2,6-diyl; or 1,2,3,4-tetrahydronaphthalene-2,6-

diyl, where all of these groups are unsubstituted or monosubstituted or polysubstituted by halogen, CN or NO₂ or alkyl, alkoxy, alkylcarbonyl or alkoxy carbonyl having from 1 to 7 carbon atoms, in which one or more H atoms are optionally replaced by F or Cl, and

m is 1, 2, 3, 4 or 5,

provided that at least one of the radicals X¹¹, X²² and Z¹¹ is -CF₂O-, -OCF₂-, -CF₂S-, -SCF₂-, -CF₂CH₂-, -CF₂CF₂-, -CF=CH- or -CF=CF- and at least one of the radicals R¹¹ and R²² is a chiral group,

- compounds of the formula XVI



in which

R¹¹ and R²² are each, independently of one another: H; F; Cl; Br; CN; SCN; SF₅; or a chiral or achiral alkyl having up to 30 carbon atoms, which is unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which one or more non-adjacent CH₂ groups are each, independently of one another, optionally replaced by -O-, -S-, -NH-, -N(CH₃)-, -CO-, -COO-, -OCO-, -OCO-O-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a way that O atoms are not linked directly to one another; or a polymerizable group,

X³³, X⁴⁴, Z¹¹ and Z²² are each, independently of one another, -O-, -S-, -CO-, -COO-, -OCO-, -O-COO-, -CO-N(R⁰⁰)-, -N(R⁰⁰)-CO-, -OCH₂-, -CH₂O-, -SCH₂-, -CH₂S-, -CF₂O-, -OCF₂-, -CF₂S-, -SCF₂-, -CH₂CH₂-, -CF₂CH₂-, -CH₂CF₂-, -CF₂CF₂-, -CH=CH-, -CF=CH-, -CH=CF-, -CF=CF-, -C≡C-, -CH=CH-COO-, -OCO-CH=CH- or a single bond,

R⁰⁰ is H or alkyl having from 1 to 4 carbon atoms,

A¹¹ and A²² are each, independently of one another: 1,4-phenylene, in which one or more CH groups are optionally replaced by N; 1,4-cyclohexylene, in which one or two non-adjacent CH₂ groups are optionally replaced by O and/or S; 1,3-dioxolane-4,5-diyl; cyclohexenylene; bicyclo[2.2.2]octylene; piperidine-1,4-diyl; naphthalene-2,6-diyl; decahydronaphthalene-2,6-diyl; or 1,2,3,4-tetrahydronaphthalene-2,6-diyl; where all these groups are unsubstituted or monosubstituted or polysubstituted by halogen, CN or NO₂ or alkyl, alkoxy, alkylcarbonyl or alkoxy carbonyl having from 1 to 7 carbon atoms, in which one or more H atoms are optionally replaced by F or Cl,

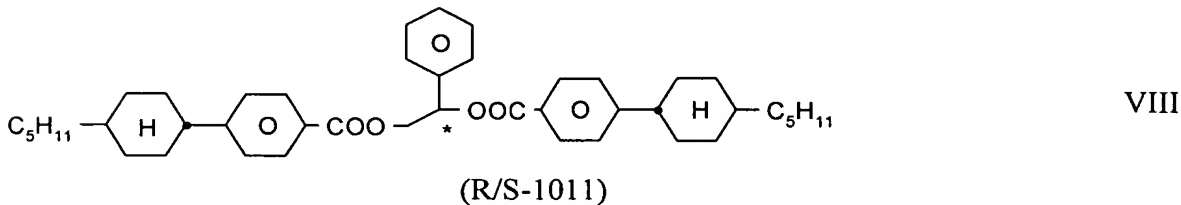
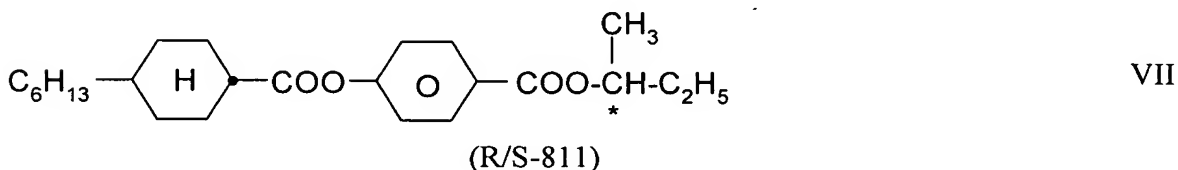
m and n are each, independently of one another, 1, 2, 3 or 4, and

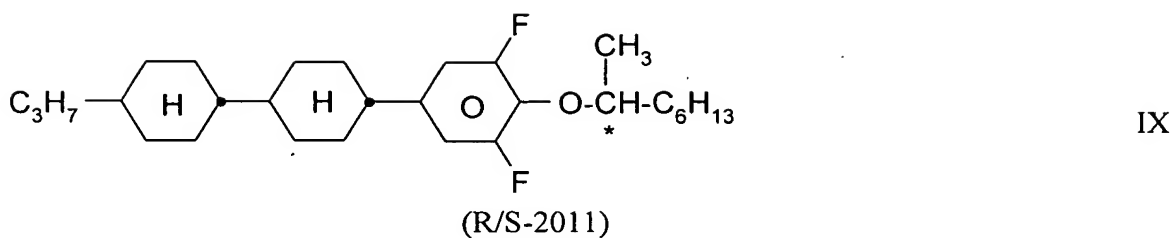
G is a bivalent chiral group,

in which at least one of the radicals X³³, X⁴⁴, Z¹¹ and Z²² is -CF₂O-, -OCF₂-, -CF₂S-, -SCF₂-, -CF₂CH₂-, -CF₂CF₂-, -CF=CH- or -CF=CF-.

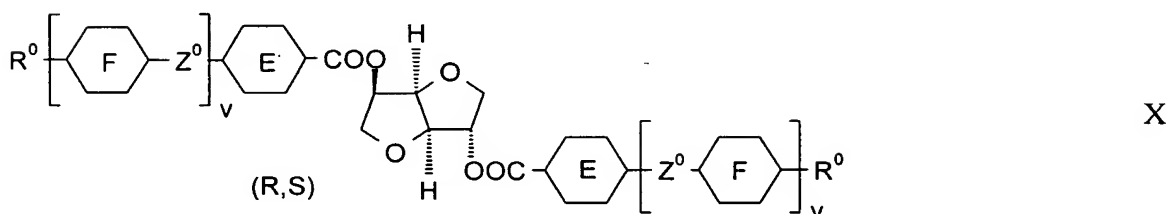
22. (New) A medium according to claim 2, wherein the optically active component includes at least one compound of the following:

- cholesteryl nonanoate,
- compounds of the formulae VII to IX:

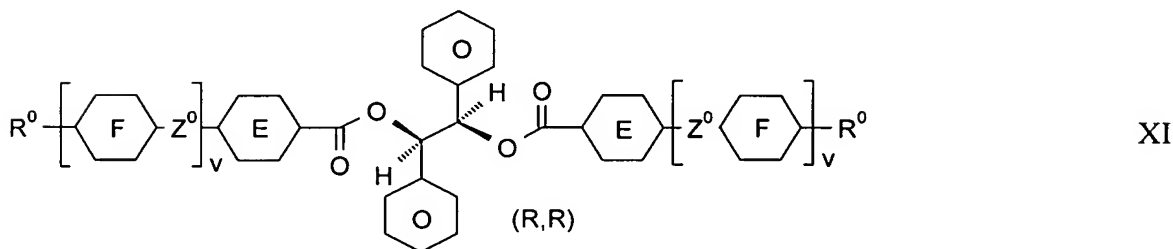




- compounds of the formula X:



- compounds of the formula XI:



wherein, in formula X and XI,

E and F are each, independently of one another; 1,4-phenylene, which is optionally monosubstituted, disubstituted or trisubstituted by L; or 1,4-cyclohexylene,

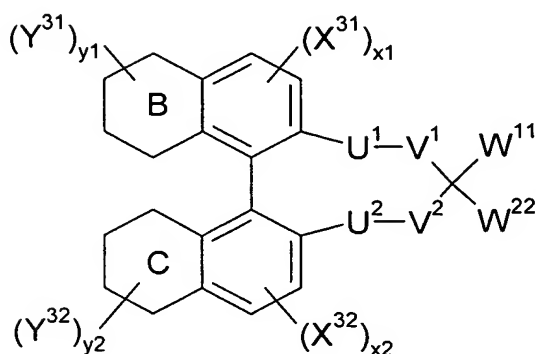
L is H, F, Cl, CN or optionally halogenated alkyl, alkoxy, alkylcarbonyl, alkoxy carbonyl or alkoxy carbonyloxy having 1-7 carbon atoms,

v is 0 or 1,

Z^0 is $-\text{COO}-$, $-\text{OCO}-$, $-\text{CH}_2\text{CH}_2-$ or a single bond, and

R is alkyl, alkoxy, alkylcarbonyl, alkoxy carbonyl or alkylcarbonyloxy having 1-12 carbon atoms,

compounds of the formula XII:



XII

in which:

X^{31} , X^{32} , Y^{31} and Y^{32} are each, independently of one another: H; F; Cl; Br; I; CN; SCN; SF_5 ; straight-chain or branched alkyl having up to 25 carbon atoms, optionally unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which one or more non-adjacent CH_2 group, independently of one another, are optionally replaced by $-\text{O}-$, $-\text{S}-$, $-\text{NH}-$, $-\text{NR}^{00}-$, $-\text{CO}-$, $-\text{COO}-$, $-\text{OCO}-$, $-\text{OCO-O}-$, $-\text{S-CO}-$, $-\text{CO-S}-$, $-\text{CH}=\text{CH}-$ or $-\text{C}\equiv\text{C}-$ in such a way that O and/or S atoms are not linked directly to one another; a polymerizable group; cycloalkyl or aryl having up to 20 carbon atoms, which are optionally monosubstituted or polysubstituted by L or a polymerizable group,

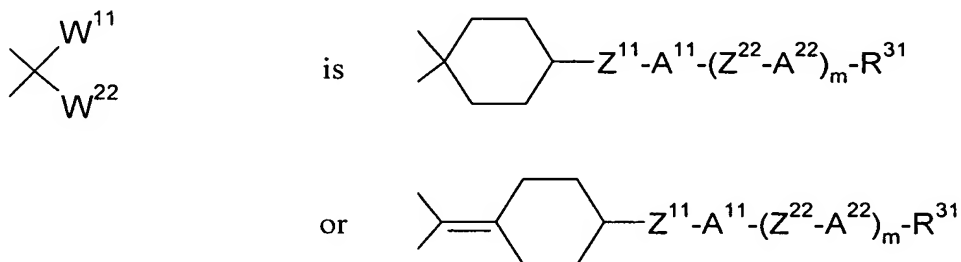
R^{00} is H or alkyl having from 1 to 4 carbon atoms,

x^1 and x^2 are each, independently of one another, 0, 1 or 2,

y^1 and y^2 are each, independently of one another, 0, 1, 2, 3 or 4,

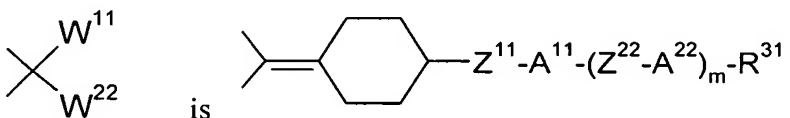
B and C are each, independently of one another, an aromatic or partially or fully saturated aliphatic six-membered ring, in which one or more CH groups are optionally replaced by N and one or more CH₂ groups are optionally replaced by O and/or S,

one of the radicals W¹¹ and W²² is -Z¹¹-A¹¹-(Z²²-A²²)_m-R³¹ and the other is R³² or A³³, or both radicals W¹¹ and W²² are -Z¹¹-A¹¹-(Z²²-A²²)_m-R³¹, where W¹ and W² are not simultaneously H, or



U¹ and U² are each, independently of one another, CH₂, O, S, CO or CS,

V¹ and V² are each, independently of one another, (CH₂)_n, in which up to four non-adjacent CH₂ groups are optionally replaced by O and/or S, and one of the radicals V¹ and V² or, if



one or both radicals V¹ and V² are alternatively a single bond,

n is an integer from 1 to 7,

Z¹¹ and Z²² are each, independently of one another, -O-, -S-, -CO-, -COO-, -OCO-, -O-COO-, -CO-NR⁰⁰-, -NR⁰⁰-CO-, -OCH₂-, -CH₂O-, -SCH₂-, -CH₂S-, -CF₂O-, -OCF₂-, -CF₂S-, -SCF₂-, -CH₂CH₂-, -CF₂CH₂-, -CH₂CF₂-, -CF₂CF₂-, -CH=CH-, -CH=N-,

-N=CH-, -N=N-, -CF=CH-, -CH=CF-, -CF=CF-, -C≡C-, -CH=CH-COO-, -OCO-CH=CH- or a single bond,

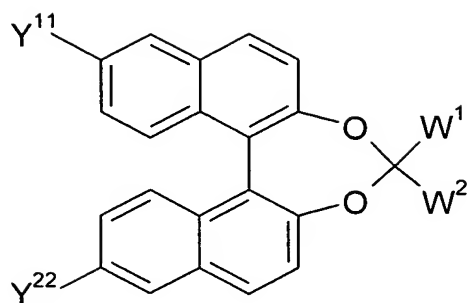
A¹¹, A²² and A³³ are each, independently of one another: 1,4-phenylene, in which, in addition, one or more CH groups are optionally replaced by N; 1,4-cyclohexylene, in which, one or more non-adjacent CH₂ groups are optionally replaced by O and/or S; 1,3-dioxolane-4,5-diyl; 1,4-cyclohexenylenyl; 1,4-bicyclo[2.2.2]octylene; piperidine-1,4-diyl; naphthalene-2,6-diyl; decahydronaphthalene-2,6-diyl; or 1,2,3,4-tetrahydronaphthalene-2,6-diyl; where all these groups are unsubstituted or monosubstituted or polysubstituted by L, and A¹¹ is alternatively a single bond,

L is halogen, CN, NO₂ or an alkyl, alkoxy, alkylcarbonyl or alkoxy carbonyl group having from 1 to 7 carbon atoms, in which one or more H atoms are optionally replaced by F or Cl,

m is in each case, independently of one another, 0, 1, 2 or 3, and

R³¹ and R³² are each, independently of one another: H; F; Cl; Br; I; CN; SCN; OH; SF₅; straight-chain or branched alkyl having up to 25 carbon atoms, which is unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which, one or more non-adjacent CH₂ groups, each independently of one another, are optionally replaced by -O-, -S-, -NH-, -NR⁰⁰-, -CO-, -COO-, -OCO-, -OCO-O-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a way that O and/or S atoms are not linked directly to one another; or a polymerizable group,

- compounds of the formula XIII:

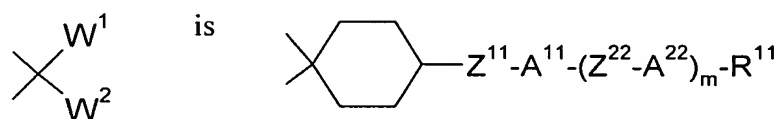


XIII

in which:

Y^{11} and Y^{22} are each, independently of one another: H; F; Cl; Br; I; CN; SCN; SF_5 ; a chiral or achiral alkyl having up to 30 carbon atoms, which is unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which one or more non-adjacent CH_2 groups are each, independently of one another, optionally replaced by -O-, -S-, -NH-, -N(CH₃)-, -CO-, -COO-, -OCO-, -OCO-O-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a way that O atoms are not linked directly to one another; or a polymerizable group,

one of the radicals W^1 and W^2 is $-Z^{11}-A^{11}-(Z^{22}-A^{22})_m-R^{11}$ and the other is H, R^{22} or A^{33} , or both radicals W^1 and W^2 are $-Z^1-A^1-(Z^2-A^2)_m-R$, where W^1 and W^2 are not simultaneously H, or



Z^{11} and Z^{22} are each, independently of one another, -O-, -S-, -CO-, -COO-, -OCO-, -O-COO-, -CO-N(R⁰⁰)-, -N(R⁰⁰)-CO-, -OCH₂-, -CH₂O-, -SCH₂-, -CH₂S-, -CF₂O-, -OCF₂-, -CF₂S-, -SCF₂-, -CH₂CH₂-, -CF₂CH₂-, -CH₂CF₂-, -CF₂CF₂-, -CH=CH-, -CH=N-, -N=CH-, -N=N-, -CF=CH-, -CH=CF-, -CF=CF-, -C≡C-, -CH=CH-COO-, -OCO-CH=CH- or a single bond,

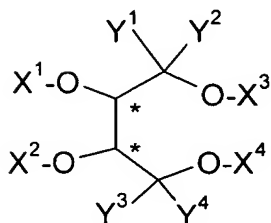
R^{00} is H or alkyl having from 1 to 4 carbon atoms,

A^{11} , A^{22} and A^{33} are each, independently of one another: 1,4-phenylene, in which, one or more CH groups are optionally replaced by N; 1,4-cyclohexylene, in which one or more non-adjacent CH_2 groups are optionally replaced by O and/or S; 1,3-dioxolane-4,5-diyl; 1,4-cyclohexenylenylene; 1,4-bicyclo[2.2.2]octylene; piperidine-1,4-diyl; naphthalene-2,6-diyl; decahydronaphthalene-2,6-diyl; or 1,2,3,4-tetrahydronaphthalene-2,6-diyl, where all these groups are unsubstituted or monosubstituted or polysubstituted by halogen, CN or NO_2 or alkyl, alkoxy, alkylcarbonyl or alkoxy carbonyl having from 1 to 7 carbon atoms, in which one or more H atoms are optionally replaced by F or Cl, and A^{11} is alternatively a single bond,

m is 0, 1, 2 or 3, and

R^{11} and R^{22} are each, independently of one another, as defined for Y^{11} ,

- compounds of formula XIV



XIV

in which

X^1 and X^2 are H, or together form a bivalent radical selected from the group consisting of $-CH_2-$, $-CHR^{11}-$, $-CR^{11}_2-$, $-SiR^{11}_2-$ and 1,1-cycloalkylidene,

X^3 and X^4 have one of the meanings indicated for X^1 and X^2 ,

Y^1 , Y^2 , Y^3 and Y^4 may be identical or different and are each, independently of one another, R^{11} , A or $M-R^{22}$,

A is a cyclic group,

M is a mesogenic group, and

R^{11} and R^{22} are each, independently of one another: H; F; Cl; Br; CN; SCN; SF_5 ; a chiral or achiral alkyl having up to 30 carbon atoms, which is optionally unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which one or more non-adjacent CH_2 groups are each, independently of one another, optionally replaced by -O-, -S-, -NH-, -N(CH₃)-, -CO-, -COO-, -OCO-, -OCO-O-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a way that O atoms are not linked directly to one another; or are a polymerizable group, where at least one of the radicals Y^1 , Y^2 , Y^3 and Y^4 is $M-R^{22}$,

- compounds of the formula XV



in which

R^{11} and R^{22} are each, independently of one another: H; F; Cl; Br; CN; SCN; SF_5 ; a chiral or achiral alkyl having up to 30 carbon atoms, which is unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which one or more non-adjacent CH_2 groups are each, independently of one another, optionally replaced by -O-, -S-, -NH-, -N(CH₃)-, -CO-, -COO-, -OCO-, -OCO-O-, -S-CO-, -CO-S-, -CH=CH- or -C≡C- in such a way that O atoms are not linked directly to one another; a chiral radical containing one or more aromatic or aliphatic ring groups, which optionally contains fused or spiro-linked rings and one or more heteroatoms; or a polymerizable group,

X^{11} and X^{22} are each, independently of one another, $-CF_2O-$, $-OCF_2-$, $-CF_2S-$, $-SCF_2-$, $-CF_2CH_2-$, $-CH_2CF_2-$, $-CF_2CF_2-$, $-CF=CH-$, $-CH=CF-$, $-CF=CF-$ or a single bond,

Z^{11} is in each case, independently of one another, $-O-$, $-S-$, $-CO-$, $-COO-$, $-OCO-$, $-O-COO-$, $-CO-N(R^{00})-$, $-N(R^{00})-CO-$, $-OCH_2-$, $-CH_2O-$, $-SCH_2-$, $-CH_2S-$, $-CF_2O-$, $-OCF_2-$, $-CF_2S-$, $-SCF_2-$, $-CH_2CH_2-$, $-CF_2CH_2-$, $-CH_2CF_2-$, $-CF_2CF_2-$, $-CH=CH-$, $-CF=CH-$, $-CH=CF-$, $-CF=CF-$, $-C\equiv C-$, $-CH=CH-COO-$, $-OCO-CH=CH-$ or a single bond,

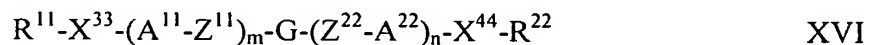
R^{00} is H or alkyl having from 1 to 4 carbon atoms,

A^{11} and A^{22} are each, independently of one another: 1,4-phenylene, in which, in addition, one or more CH groups are optionally replaced by N; 1,4-cyclohexylene, in which one or two non-adjacent CH_2 groups are optionally replaced by O and/or S; 1,3-dioxolane-4,5-diyl; cyclohexenylene; bicyclo[2.2.2]octylene; piperidine-1,4-diyl; naphthalene-2,6-diyl; decahydronaphthalene-2,6-diyl; or 1,2,3,4-tetrahydronaphthalene-2,6-diyl, where all of these groups are unsubstituted or monosubstituted or polysubstituted by halogen, CN or NO_2 or alkyl, alkoxy, alkylcarbonyl or alkoxy carbonyl having from 1 to 7 carbon atoms, in which one or more H atoms are optionally replaced by F or Cl, and

m is 1, 2, 3, 4 or 5,

provided that at least one of the radicals X^{11} , X^{22} and Z^{11} is $-CF_2O-$, $-OCF_2-$, $-CF_2S-$, $-SCF_2-$, $-CF_2CH_2-$, $-CF_2CF_2-$, $-CF=CH-$ or $-CF=CF-$ and at least one of the radicals R^{11} and R^{22} is a chiral group,

compounds of the formula XVI



in which

R^{11} and R^{22} are each, independently of one another: H; F; Cl; Br; CN; SCN; SF_5 ; or a chiral or achiral alkyl having up to 30 carbon atoms, which is unsubstituted or monosubstituted or polysubstituted by F, Cl, Br, I or CN, and in which one or more non-adjacent CH_2 groups are each, independently of one another, optionally replaced by -O-, -S-, -NH-, -N(CH_3)-, -CO-, -COO-, -OCO-, -OCO-O-, -S-CO-, -CO-S-, -CH=CH- or -C \equiv C- in such a way that O atoms are not linked directly to one another; or a polymerizable group,

X^{33} , X^{44} , Z^{11} and Z^{22} are each, independently of one another, -O-, -S-, -CO-, -COO-, -OCO-, -O-COO-, -CO-N(R^{00})-, -N(R^{00})-CO-, -OCH $_2$ -, -CH $_2$ O-, -SCH $_2$ -, -CH $_2$ S-, -CF $_2$ O-, -OCF $_2$ -, -CF $_2$ S-, -SCF $_2$ -, -CH $_2$ CH $_2$ -, -CF $_2$ CH $_2$ -, -CH $_2$ CF $_2$ -, -CF $_2$ CF $_2$ -, -CH=CH-, -CF=CH-, -CH=CF-, -CF=CF-, -C \equiv C-, -CH=CH-COO-, -OCO-CH=CH- or a single bond,

R^{00} is H or alkyl having from 1 to 4 carbon atoms,

A^{11} and A^{22} are each, independently of one another: 1,4-phenylene, in which one or more CH groups are optionally replaced by N; 1,4-cyclohexylene, in which one or two non-adjacent CH_2 groups are optionally replaced by O and/or S; 1,3-dioxolane-4,5-diyl; cyclohexenylene; bicyclo[2.2.2]octylene; piperidine-1,4-diyl; naphthalene-2,6-diyl; decahydronaphthalene-2,6-diyl; or 1,2,3,4-tetrahydronaphthalene-2,6-diyl; where all these groups are unsubstituted or monosubstituted or polysubstituted by halogen, CN or NO_2 or alkyl, alkoxy, alkylcarbonyl or alkoxy carbonyl having from 1 to 7 carbon atoms, in which one or more H atoms are optionally replaced by F or Cl,

m and n are each, independently of one another, 1, 2, 3 or 4, and

G is a bivalent chiral group,

in which at least one of the radicals X^{33} , X^{44} , Z^{11} and Z^{22} is $-\text{CF}_2\text{O}-$, $-\text{OCF}_2-$, $-\text{CF}_2\text{S}-$, $-\text{SCF}_2-$, $-\text{CF}_2\text{CH}_2-$, $-\text{CF}_2\text{CF}_2-$, $-\text{CF}=\text{CH}-$ or $-\text{CF}=\text{CF}-$.